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**Impact of**  
**U.S. NONFAT DRY**  
**MILK**  
**in JAPAN**  
**1948-59**



<sup>5a</sup>  
**FAS-M-82**

<sup>5c</sup>  
**June 1960**

<sup>5b</sup>  
**Foreign Agricultural Service**  
**United States Department of Agriculture**

## ACKNOWLEDGMENTS

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## FOREWORD

This study, made in Japan in November-December 1959, shows that the products of U. S. dairy farmers have played an important part in leading the Japanese people to higher levels of demand for these foods, particularly for nonfat dry milk.

Unusual, yet evident, is the striking fact that, during this period (1948 to 1959) in which U. S. exports of nonfat were at very high levels, local milk production in Japan increased more than sevenfold.

While Japan, through various agricultural reforms and the application of technical knowledge, is making rapid strides in increasing agricultural production, it is doubtful if the country can meet total food needs in the foreseeable future.

This report reveals that concomitant to the improving economic situation of the Japanese people there has been an increase in the effective demand for dairy products in that country.

Precise measurements of the impact of U. S. nonfat dry milk in Japan are not available. This study suggests, however, its influence has been considerable and that Japan could become an increasingly important customer for U. S. dairy products.

A handwritten signature in dark ink, reading "David L. Hume". The signature is fluid and cursive, with the first letters of each word being capitalized and prominent.

David L. Hume, Director  
Dairy and Poultry Division

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Photographs were made available through the courtesy of the Japanese Ministry of Agriculture and Forestry.



X IMPACT OF U. S. NONFAT DRY MILK IN JAPAN, 1948-59 X

By W. Bruce Silcox  
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Summary

The overall impact of the shipments of nonfat dry milk that the United States has been making to Japan has been favorable. Not only has Japan's dairy industry expanded substantially, but the use of the nonfat dry milk has apparently stimulated milk consumption and helped improve the nutritional standard of recipients. 1/ In the past decade, concurrent with the shipments of U. S. nonfat dry milk, the use of milk as fluid milk has more than tripled, and national studies attest to the marked improvement in the physical stature of Japanese students.

Since 1948, U. S. shipments of nonfat dry milk to Japan have varied from 5.7 million pounds during that year to a high of 66.9 million in 1957. The 1955-59 annual average exceeded 55 million pounds. During recent years, most of the nonfat has been shipped under government-to-government negotiated sales for use in Japan's school lunch program. This milk is currently being distributed to 9.5 million pupils through 14,272 schools. In addition, shipments have gone to welfare agencies--11.5 million pounds in 1959.

Commercial shipments of U. S. nonfat dry milk to Japan are virtually nonexistent because foreign exchange is not allocated for them. If that barrier were removed, it is likely that commercial sales could be made, for both consumer and industrial uses. This is strongly suggested by the recent upsurge in sales, particularly of instant nonfat dry milk, and by the relatively favorable price of the U. S. product.

The Japanese Government wants to make available more animal protein, calcium, and fats. Its policy is to increase livestock production for this purpose, which, incidentally will undoubtedly result in an expanded market for U. S. feeds.

1/ Of major importance also have been the dairy plants operated by a U. S. firm under contract with the U. S. Army Quartermaster Corps. Since 1948, military personnel and their dependents stationed in Japan have been supplied recombined milk and other dairy products under this contract. These products are recombined from U. S.-produced anhydrous milkfat and low-heat spray-process, nonfat dry milk using standard dairy equipment. Between the commencement of this contract and the present, many Japanese nationals have been employed in the several U. S. dairy plants throughout Japan, and have received invaluable technical training regarding the manufacture and preparation, as well as the distribution and handling of dairy products. Many of these Japanese nationals are now employed in the Japanese dairy industry, and they no doubt have contributed substantially to the development and growth of this industry.

However, it has two problems that may well tend to keep domestic milk production lower than the contemplated increase in consumption of milk and dairy products: Limitations on the availability of new areas of arable land and the speed with which such land can be brought into use. At present, the low per capita income and a general reluctance to pay the price for domestically produced non-fat dry milk are restricting its use for both home and industrial use. These may be short-time factors, however. Gross national income and income per capita have increased markedly during recent years, and several economic indicators provide government and private economic circles with a basis for the widely held belief that Japan may be only on the threshold of increased economic activity and a much improved financial position.

Already, extensive programs in nutrition are in progress, and government and industry alike are highly conscious of the importance of greater education in this field.

Immediate prospects for a significant commercial market for U. S. nonfat dry milk in Japan are not clearly in evidence, but the longer term prospects, embracing, for example, 10 to 15 to 20 years, may be assessed as appearing to offer substantial possibilities.

#### Annual U. S. Shipments Substantial

In the 10 years 1950-59, shipments of U. S. nonfat dry milk to Japan exceeded 44 million pounds annually. They have fluctuated from year to year, sometimes widely, but from 1954 through 1957 they climbed steadily to reach a peak of 66.9 million pounds. Then they declined, and rather substantially, between 1958 and 1959. In 1959, a drought in Europe and an apparent increased need for nonfat dry milk in other countries resulted in an unusually large request to the U. S. Government for the product.

TABLE 1.--Nonfat dry milk: Total U. S. exports to all countries and to Japan, 1948-59

Year	Total U. S. exports	U. S. exports to Japan	Year	Total U. S. exports	U. S. exports to Japan
	1,000 lb.	1,000 lb.		1,000 lb.	1,000 lb.
1948-----	159,200	5,702	1954-----	257,234	40,242
1949-----	214,498	53,506	1955-----	562,920	49,860
1950-----	331,108	58,931	1956-----	615,469	59,493
1951-----	224,094	35,163	1957-----	670,654	66,974
1952-----	59,526	9,893	1958-----	673,960	58,555
1953-----	182,510	18,548	1959-----	660,702	44,426

Taking the latest 3 years, 1957-59, shipments of nonfat dry milk to Japan were about 8 percent of total U. S. exports of this product, and they were about 9





Modern dairy in the suburbs of Tokyo

percent of the shipments under U. S. Government programs to all countries. During recent years, most of the shipments of nonfat dry milk to Japan have been made under government programs.

TABLE 2.--Nonfat dry milk: U. S. shipments to Japan, by type of shipment, 1958 and 1959

Item	1958	1959
	1,000 pounds	1,000 pounds
Government-to-government programs <sup>1/</sup> -----	33,635	33,687
Title II, Public Law 480 <sup>1/</sup> -----	12,410	---
Title III, selected welfare agencies-----	10,314	6,226
United Nations Children's Fund-----	2,196	2,663
Other-----	---	1,850
Total-----	58,555	44,426

<sup>1/</sup> Livestock and Dairy Division, Commodity Stabilization Service.

About 90 percent of these government-to-government sales in 1958 and 1959 were

for use in the school lunch program of Japan and by authorized nonprofit welfare agencies. In accordance with Title II of Public Law 480, exports under that authority were used "to help friendly foreign people to meet famine or other urgent or extraordinary relief requirements." Quantities exported within the scope of this authority and shipments for the use of welfare agencies were donated from U. S. Government stocks acquired under the price support program conducted by the Department of Agriculture. Concerning the 33.6 million pounds shipped to Japan under sales by the U. S. Government to the Government of Japan in 1959, which represented more than 75 percent of the exports of nonfat dry milk to Japan during that year, the negotiated price was 3-1/2 to 4 cents per pound.

### Land Area of Japan Is Limited

Japan has a population of 93 million people and compares in size with the State of Montana. It is made up of four main islands and many smaller islands and islets. The total land area is approximately 92 million acres, much of it mountainous and hilly. There are 250 mountains with peaks 6,500 feet or more above sea level. Consequently, level arable land is scarce. Use of the total land area is roughly as follows: Forest land, 67.8 percent; arable land, 14.8 percent; building ground and other, 10.4 percent; pastureland, 3.6 percent; and unexploited land, 3.4 percent. The equivalent of about 13.7 million acres is considered to be arable; over half is planted to rice.

The Japanese Government is reportedly spending about \$100 million a year for various land improvement projects, including irrigation, reclaiming inlets and lakes, developing wastelands and hill regions, and combating land damage resulting from natural disasters, such as storms, typhoons, and floods. There is a constant increased demand for new factory and housing sites, road systems, and airports. These and other uses tend to reduce the areas of new arable land resulting from reclamation and other land improvement techniques.

### Dairy Farms Are Small

Dairy farming is practiced on a small scale in Japan. Forty-five percent of the families are farm families, but only 5 percent are dairy farm families. They occupy 388,420 farms and represent a little over 2 million people. On many farms, the dairy herd consists of 1 or 2 milk cows.

In 1959, cows in Japan numbered slightly more than 751,000. Because many are kept for draft purposes, and some are sold as beef, the number of milk cows is estimated to be close to just half that number. However, annual milk production per cow has practically doubled since 1949; and it is expected that total production in 1959 will exceed 3.7 billion pounds.

Most of the cows in Japan are Holsteins, either directly from U. S. stock or from bulls imported from the United States. The next most common breed is the Jersey, shipped in from Australia and the United States. Artificial insemination is practiced widely.

Dairy producers are widely organized into cooperatives. Processing and distribution of milk and milk products is done mostly, however, by four large companies.



TABLE 3.--Cows: Total number in Japan and milk production per cow, 1949-59

Year	Total number of cows	Annual production of milk per cow <sup>1/</sup>
	Number	Pounds
1949-----	201,788	3,056
1950-----	203,825	3,975
1951-----	225,810	4,275
1952-----	275,590	4,676
1953-----	323,360	4,857
1954-----	356,470	5,745
1955-----	421,110	5,238
1956-----	497,410	5,117
1957-----	586,800	5,119
1958-----	654,340	5,216
1959-----	751,090	5,029

<sup>1/</sup> The number of milk cows is estimated at about half the total number of cows. Accordingly, production of milk per cow may be estimated by doubling the production shown.

Statistics and Research Division, Ministry of Agriculture and Forestry, Tokyo, December 1959.

#### Price to Producers Has Declined

Although the data for the entire year 1959 were not complete when this study was made, records available for January-October inclusive show that for milk for fluid use producers received the equivalent of \$3.23 per hundred pounds and that for milk for manufacturing purposes they received \$2.76 per hundred pounds. For all milk, the average price received was \$2.96. This compared with approximately \$4.60 per hundred pounds for milk for fluid use, about \$3.15 for milk for manufacturing purposes, and roughly \$4.08 per hundred pounds received by producers for all milk in the United States during the same 10-month period.

Prices received by producers for milk in Japan were the same during the first 10 months of 1959 as during 1958. Since 1954, however, prices received by producers declined 74 cents--from \$3.96 per hundred pounds--for fluid milk, and 54 cents--from \$3.29--for milk for manufacturing purposes.

#### Output Has Increased

As regards production, the output of milk in Japan shows an increase from 518,000 pounds in 1950 to an estimated 3.7 million pounds in 1959--more than 7-1/4 times the 1950 production. Since the beginning of shipments of U. S. nonfat to Japan for school lunch purposes in 1947, milk production has apparently increased by nearly 10 times. This would seem to indicate strongly that imports of U. S. nonfat dry milk have not retarded the development of the dairy industry

in Japan. Actually, it is widely held among those close to the dairy industry that, because of the emphasis placed on the nutritive value of milk by the Government of Japan, and the extent to which the consumption of milk has resulted in the habit of drinking milk, U. S. nonfat dry milk has played a highly important part in stimulating the demand for and consumption of fluid milk.

TABLE 4.--Milk: Prices paid to producers, by type of use, in Japan, 1954-59

Year	For fluid use	For industrial use	Average
	U. S. cents per 100 lb.	U. S. cents per 100 lb.	U. S. cents per 100 lb.
1954-----	3.96	3.29	3.70
1955-----	3.42	2.75	3.22
1956-----	3.63	3.09	3.42
1957-----	3.70	3.22	3.42
1958-----	3.22	2.75	2.96
1959 <u>1</u> /-----	3.22	2.75	2.96

1/ October.

Dairy Section, Livestock Branch, Ministry of Agriculture and Forestry, Tokyo, Japan, December 1959.

During the period of shipments of nonfat dry milk to that country, the production of dairy products has also increased. Although this increase has not kept pace with milk production, it has been substantial.

Butter and condensed milk production since 1949 have increased by more than 6 times, cheese by more than 13 times, dry milk other than nonfat dry milk by roughly 2-1/2 times, and nonfat dry milk from a negligible quantity to 30 million pounds. On the basis of whole milk equivalent (fat basis), the production of these products has increased by more than 4 times the quantity produced in 1949.

#### Consumption Has Also Increased

Utilization has also been rising. In 1951, the quantity used for fluid milk purposes was 40.6 percent of the total quantity produced, and in 1958 it was 47.7 percent. The rise reflects, to some extent, the increase in demand for milk and an increased appreciation of the Japanese for its nutritive value and is in keeping with the overall objective of the Government of Japan to increase the intake of animal protein by the Japanese people.

There seems to be little question that the increase in availability of milk, including U. S. nonfat dry milk in Japan, and the emphasis placed on increased consumption by Japanese Government and nongovernment organizations have encouraged a greater consumption of milk and milk products per capita.

TABLE 5.--Milk: Production and utilization in Japan, 1950-59

Year	Production	Utilization		
		As fluid	As milk	Other uses
		milk	products	
	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds
1950-----	1/ 518,081	---	---	---
1951-----	964,951	392,575	503,218	69,158
1952-----	1,287,841	619,768	581,476	86,597
1953-----	1,569,276	754,180	694,864	120,232
1954-----	2,047,141	917,590	927,790	201,761
1955-----	2,204,545	1,065,397	912,358	226,790
1956-----	2,543,295	1,195,213	1,091,852	256,230
1957-----	3,001,872	1,362,306	1,348,347	291,219
1958-----	3,413,457	1,630,520	1,475,380	307,867
1959-----	2/ 3,770,000	---	---	---

1/ From 1950 Annual Report for Japan to Food and Agriculture Organization of the United Nations, September 20, 1950.

2/ Preliminary.

Data reviewed by Ministry of Agriculture, Tokyo, Japan, December 1959.

TABLE 6.--Selected dairy products: Production in Japan, 1949 and 1959

Dairy product	1949	1959
	1,000 pounds	1,000 pounds
Butter-----	3,856	25,794
Cheese-----	730	9,480
Condensed milk-----	24,647	145,283
Dry milk other than nonfat-----	21,087	50,265
Nonfat dry milk-----	(1/)	2/ 30,000

1/ Not available.

2/ Estimated.

Statistics and Research Division, Ministry of Agriculture and Forestry, Tokyo, Japan, December 1959.



TABLE 7.--Milk and dairy products: Per capita consumption in Japan, 1954-58

Product	1954	1955	1956	1957	1958
	Pounds	Pounds	Pounds	Pounds	Pounds
Fluid milk-----	10.39	11.93	13.23	14.95	17.73
Butter-----	.20	.19	.19	.23	.30
Cheese-----	.04	.05	.06	.08	.10
Condensed milk:					
Whole-----	1.13	.89	1.13	1.27	.99
Skim-----	.28	.28	.32	.43	.40
Evaporated milk, whole-----	.11	.09	.14	.15	.10
Dried milk, whole-----	.37	.31	.40	.51	.47
Nonfat dry milk-----	.45	.47	.60	.80	.83

Ministry of Agriculture, Tokyo, Japan, December 1959.

From 1954 through 1958, fluid milk consumption per capita increased 7.34 pounds, or 70.6 percent. Increases in the per capita consumption of all products of milk, except evaporated and condensed whole milk, occurred from relatively small beginning or base quantities. The consumption of evaporated milk showed an increasing trend through 1957, but declined to approximately its 1954 level in 1958. Compared with consumption of these products in the United States, consumption per capita in Japan leaves much room for progress. On a milk equivalent basis, consumption per capita in the United States is indicated to be 21.7 times what it is in Japan.

Possibly the most recent data on per capita consumption of milk and milk products in Japan made available are those released by the Ministry of Health and Welfare in January 1960. 2/ These disclose that the daily per capita consumption of milk and milk products (which was 6.8 grams in that country in 1950) had increased to 24.6 grams in 1958. The 1958 daily per capita consumption is an increase of 33.7 percent from the corresponding figure for 1957. Although a number of factors contributed to this increase, the stimulus given by U. S. nonfat dry milk is widely recognized in Japan as having played an important part. Moreover, as the appreciation of the nutritive value of milk becomes more widespread each year, further substantial increases in the consumption of milk and milk products may be expected.

#### Improved Nutrition Receives Emphasis

A significant factor in the increase in consumption of milk and other nutritive foods has been the emphasis given to this by the Japanese Government and other organizations. Although efforts to counteract widely prevalent malnutrition were initiated as far back as the beginning of the 20th century, it was

2/ "Nutrition in Japan," 1959, Ministry of Health and Welfare.

not until 1937, following the damage by cold to the rice crop that health centers were established throughout Japan. Since then, nutritionists have been stationed in all prefectures, and in 1956 the nutrition section was organized in the Ministry of Health and Welfare. In 1947 and in 1952, nutrition improvement legislation which strengthened nutrition administration was enacted, and, in 1958, legislation which provided certain authorizations regarding the supervision of the training institutions for cooks and the examination for qualifying cooks was passed. A significant feature of the nutrition improvement legislation was the provision for continuing national nutrition surveys which have been carried on since 1946.

TABLE 8.--Milk and dairy products: Per capita consumption in selected countries, 1958

Country	Fluid milk and cream	Butter	Cheese	Canned milk	Dried milk	Total milk equivalent
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Japan-----	17.74	0.315	0.97	1.08	1.26	31.76
Finland-----	666	29.7	5.3	(1/)	(1/)	1,312
New Zealand--	476	42.6	6.2	(1/)	2.2	1,298
Norway-----	500	7.9	17.8	12.2	(1/)	875
Switzerland--	429	14.5	17.7	2.9	(1/)	939
Canada-----	413	19.3	6.6	19.2	6.6	954
United States:	397	8.4	8.1	19.4	5.9	691

1/ Not available.

Currently, nutrition guidance programs are formulated at the ministerial level and transmitted to prefectures and cities from which the health centers receive instructions. Duties of health center nutritionists include consultations particularly regarding tuberculosis, maternity care, and feeding of infants and children.

The organization of classes of mothers, cooks, and group feeding personnel for discussions and cooking demonstrations and the conducting of surveys and cooperation with national prefectural and municipal policies also come within the scope of the nutrition guidance programs.

Among the activities and organizations currently contributing to the general field of nutrition are the following: The National Institute of Nutrition, which carries on basic research regarding nutritional deficiencies, food analysis, and nutritive ingredients; the Nutrition Improvement Movement, in which several of the ministries of the Japanese Government, national boards, and many private organizations cooperate; the Japan Nutrition Association, a private foundation that among other educational activities carries on field demonstrations to illustrate the value and methods of preparation of highly nutritive foods. Others include the National Council of Nutrition, Japan Red Cross Society, Japan



A parade promoting  
the sales of milk, sponsored  
by the Okayama  
Prefectural Government.

Nutritionists Association, Housewives Federation, Women's Organizations Federation, Imperial Gift Foundation for Child and Maternity Welfare, National Federation of Social Welfare Organizations, Japan Food Society, and the Japan Public Health Society.

#### School Lunch Program Extensive

In 1889 a school lunch program was first operated in Japan, by a religious group to stimulate the children of poor and needy families to attend schools. <sup>3/</sup> Not until 1932, however, did the government adopt the program in its policy. In November 1946, after the termination of World War II, the school lunch program was reopened. The program was then considered as a part of the educational program of Japan. In 1954, a school lunch law setting forth a framework of objectives and regulations was enacted. In 1959, 9.5 million pupils in 14,277 schools throughout Japan were participating in the program. This is more than 40 percent of the primary schools and more than 70 percent of the children in those schools. Other schools within the scope of the compulsory education system, including lower secondary schools and lower secondary departments of special education schools, also participate. Lunch is served in schools in Japan 215 days per year. Both the full meals and the supplementary meals served include milk. From 1947 through 1959, the number of schools and pupils participating more than doubled.

<sup>3/</sup> "School Lunch Program in Japan," Ministry of Education, Government of Japan, November 1958.





Milk with lunch in a Japanese school.

In order to accomplish the objectives sought regarding nutrition through school lunches, on recommendation of nutritionists the Ministry of Education has established a standard for use in preparing school lunch meals (table 9).

TABLE 9.--School lunch program: Number of schools and pupils participating, Japan, 1946-59

Year	: Number of schools	: Number particip- ating	::	Year	: Number of schools	: Number particip- ating
1946-----	276	251,629	::	1953-----	7,152	5,708,557
1947-----	5,467	4,137,975	::	1954-----	9,877	6,866,372
1948-----	9,036	6,292,311	::	1955-----	10,275	7,242,575
1949-----	10,882	7,178,557	::	1956-----	10,827	7,861,511
1950-----	11,046	7,461,320	::	1957-----	11,368	8,170,059
1951-----	11,595	7,916,785	::	1958-----	12,845	9,095,599
1952-----	7,462	5,857,457	::	1959-----	14,277	9,500,000

"School Lunch Program in Japan," MEJ 6218, Ministry of Education, Government of Japan, 1958, and supplementary data.

On account of different conditions among prefectures throughout Japan, the requirements cannot always be precisely met, but they are adhered to as closely as possible.

TABLE 10.--School lunch program: Standard quantity of nutrition per pupil per meal, Japan, 1959

Items and unit	Infants of special schools	Pupils of primary schools	Pupils of lower second- ary schools	Pupils of upper second- ary schools
Calories-----number--	500	600	800	900
Protein-----grams--	20	25	30	32
Of which, animal-----grams--	10	10	12	12
Fat-----grams--	8	7	10	13
Calcium-----grams--	.4	.6	.8	.8
Iron-----milligrams--	3	6	7	7
Vitamin A-----international units--	1,000	2,000	2,500	2,500
Vitamin B <sub>1</sub> -----milligrams--	.4	.7	.8	.8
Vitamin B <sub>2</sub> -----milligrams--	.4	.8	.9	.9
Vitamin C-----milligrams--	15.0	20.0	25.0	25.0

School Lunch Program in Japan, MEJ 6218, Ministry of Education, Government of Japan, November 1958, and supplementary information.

In meeting the standard of nutrition, the principal components from the standpoint of calories are bread made from wheat flour, milk, meat, beans, and potatoes, butter or margarine or some other fat, vegetables, sugar, and starch.

The standard quantity of nonfat dry milk served in primary schools is 22 grams per lunch, usually reconstituted into liquid form. <sup>4/</sup> Nonfat dry milk is also used in the manufacture of some of the bread used in the program and in the preparation of other foods as needed. The calorie content of the 22 grams of nonfat dry milk is taken as 79 <sup>5/</sup>, and the protein content is considered as being 7.8 grams. Calcium, iron, riboflavin, thiamin, niacin, Vitamin C and lactose found in nonfat dry milk also add to the nutritional value of the lunches served.

#### Milk Influences Physical Stature

Because milk is served to students in combination with other foods, the precise effects of milk on them is not easily isolated. However, the results of

<sup>4/</sup> In junior high schools, the corresponding quantity is 27 grams per lunch.

<sup>5/</sup> About 60 percent of the calorie content of school lunches, as now served, is obtained from flour, which is generally baked into bread.



studies made in this area are quite impressive. Of particular significance here would appear to be the studies of Professor Masaji Kondo of Tohoku University. The results have special application, because during the years 1946-50 milk was the main item in the school lunch program. In 1950 bread was added to more nearly constitute a complete lunch. The first study included pupils of the sixth grade in primary schools in the city of Sendai in Miyagi Prefecture, and disclosed that in 1952 the height and weight of male pupils, which had improved greatly, had returned to the level of prewar days, while that of the girls exceeded the prewar standard. 6/

In 1958, further study disclosed the average height of the sixth grade students exceeded the average of prewar years by the equivalent of 1.28 inches for boys and 1.77 inches for girls. Boys outweighed their counterparts by 4.18 pounds, while the girls exceeded the prewar level by the equivalent of 6.22 pounds. Professor Kondo is quoted as attributing this increase in height and weight primarily to the serving of milk in school lunches.

Because of the quality of the food consumed in households throughout Japan in recent years, it is difficult to measure the extent to which the improvement in the physical stature of the school children has resulted directly from school lunches.

However, what can be said regarding the merit of the school lunches is that the following was clearly established in Professor Kondo's study:

1. The physique of school children has improved.
2. Elementary impediments related to diet have decreased among school children.
3. The children have become healthy in general, and sicknesses, particularly colds, have diminished.
4. The children are paying much more attention to their health.

Since the physique of students caught up with the prewar level, school children of Japan have been growing taller, their weight and girth have increased considerably, and their consumption of milk continues to increase.

#### Nonfat Dry Milk Distributed Also to Needy

Food supplies, including nonfat dry milk shipped under Title III of Public Law 480 exclusive of those to United Nations Children's Fund, are distributed in Japan through three voluntary American welfare agencies. 7/ Commonly referred to as the CAC agencies, these are the Church World Service, The American Friends Service, and the Catholic Relief Services. The organizations are approved by the Japanese Government, and they work through the National Council of Social Welfare, a private agency, and with the Ministry of Welfare. The National Council of Social Welfare operates under specified government regulations. It coordinates the activities of government-approved welfare agencies and carries

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6/ Information Bulletin Vol. VI, No. 15, Ministry of Foreign Affairs, Tokyo, August 1959.

7/ "Voluntary Agency Program in Japan," International Cooperation Administration, TOICA No. A-716, Tokyo, Jan. 10, 1958.

on its welfare program as well. On shipments of this kind previous to January 1, 1957, approximately 95 percent of all ocean and inland freight costs were paid with Japanese Government funds from national, prefectural, city, and local sources. The remaining 5 percent was paid by voluntary contributions made to such organizations as the Japanese Red Cross, religious foundations, and churches. Since the date indicated, the International Cooperation Administration in Washington has assumed responsibility for paying ocean freight. Inland freight still remains the responsibility of Japan.

All nonfat dry milk received under this authority (Title III) is handled by the Tokyo Trade and Transportation Company, which is required to follow the Japanese Government's regulations pertaining to customs clearance, food tests, and storage regarding all foods. The same firm handles UNICEF and also CARE shipments.

In addition to the distribution to welfare institutions, smaller amounts of food supplies, including nonfat dry milk, have been channeled through local prefectural relief committees and churches for emergency use and to aid needy persons at the family level. Distribution has also been made to needy college and university students and to the Mennonite Central Committee in Japan.

In assisting to meet large-scale emergencies, such as flood, fires, earthquakes, and typhoons, all three of the CAC agencies cooperate in making their supplies available through the Ministry of Welfare.

In summary, all persons eligible to receive relief commodities must, in principle, be considered in need as measured by standards of the "Daily Life Security Law" enacted in part for that purpose. Distribution is made in 46 prefectures, and during 1959 was made to 2,131,640 recipients.

Distribution of U. S. nonfat dry milk under welfare programs also includes shipments to the U. N. Children's Fund organization on which the ocean freight to Japan is prepaid. Two-thirds of the transportation costs within the country are paid by the government and one-third from private sources. Under the UNICEF program in Japan, substantial quantities of nonfat dry milk have been used, particularly to improve the health of nursing and expectant mothers and to lower the mortality rate of children by improving their diet. This does not duplicate the work of the CAC agencies, and much of it is done on the smaller islands of Japan. 8/ During 1959, approximately 4 million pounds were distributed to about 180,000 recipients.

For many years, the diet of the Japanese people has been based on rice, supplemented by soybeans and fish as the principal source of protein. Reports received by UNICEF and other welfare agencies point out that the use of nonfat dry milk distributed to the needy has played an important role in increasing the annual protein intake of those served and has had a "very favorable" effect on their health.

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8/ Voluntary report, International Cooperation Administration, TOICA, No. A-723, Tokyo, December 1959

## Consumer Purchases Should Increase

There are distinct possibilities for expanding the consumption of nonfat dry milk by individual consumers as such. If the Japanese bought half as much nonfat dry milk as the Americans do, the present population of 93 million would account for about 45 million pounds a year. This is considerably higher than the 4 million to 5 million pounds estimated to have been bought by individuals in 1958. A number of commercial outlets also would appear to offer substantial opportunities over the years ahead.

Bakery Products.--For a number of years, bakers in the United States have been convinced that they could improve the quality of their bread by adding dry milk solids. Of the 851 million pounds of nonfat dry milk sold domestically in 1958 for various commercial uses, 290 million pounds went into the production of bread and related bakery items and 42 million pounds into prepared mixes. <sup>9/</sup> Although the use of nonfat dry milk in making bread and other bakery products in Japan is increasing, by no means has the maximum use in this field been achieved. The excellent work done by the bakers of Japan in cooperation with the American Dry Milk Institute in demonstrating the use of nonfat dry milk in the manufacture of bakery products has contributed greatly to its present use in this area and to a wider knowledge of the benefits to be derived from expanded use of the product in the baking industry. The amount of dry milk being used annually in Japan's baking industry is not known; but, applying acceptable percentages of use to the wheat flour used in making each major bakery product (see table 12), a market for 145 million pounds seems reasonable.

In processed meat products (sausage, bologna, pressed ham, weiners, salami, etc.) the potential is not as striking, but if the present limited current rate of use of nonfat dry milk in this industry were applied to the quantity of meat currently being processed, the quantity of nonfat dry milk used would exceed 4 million pounds.

TABLE 11.--Nonfat dry milk solids: Amount that can be used in bakeries in Japan at present rate of wheat flour utilization

Bakery product	Wheat flour used, 1958 <sup>1/</sup>	Nonfat dry milk solids that could be used
	Pounds	Pounds
Bread-----	1,580,654,108	94,839,246
Biscuits-----	509,701,000	24,582,060
Cookies-----	152,778,780	15,277,878
Cakes-----	65,476,620	10,476,259
Total-----	2,208,610,508	145,175,443

<sup>1/</sup> All Japan Federation of Bakers, Tokyo, Japan, December 1959.

<sup>9/</sup> 1958 Census of Dry Milk Distribution and Production; The American Dry Milk Institute, Inc.; Chicago, Illinois, 1959.



Mass Feeding.--In Japan, mass-feeding institutions are described as those where 100 meals or more at one time, or 250 or more meals a day, are served. The managers of such mass-feeding institutions receive the guidance of nutritionists from health centers, except managers in hospitals and institutions employing nutritionists.

TABLE 12.--Mass-feeding institutions: Number in Japan, 1958 <sup>1/</sup>

Type of institution	Total	Institutions with nutritionists	Institutions not having nutritionists	Percentage with nutritionists
	Number	Number	Number	Percent
Schools-----	11,803	1,406	10,397	11.9
Hospitals-----	3,104	2,632	472	84.8
Working places-----	2,811	798	2,013	28.4
Child welfare institutions-----	3,259	108	3,151	3.3
Social welfare institutions-----	452	80	372	17.7
Correctional institutions-----	132	38	94	28.8
Camps of self defense forces-----	149	112	37	75.2
Dormitories-----	1,022	172	850	16.8
Others-----	331	103	228	31.1
Total-----	23,063	5,449	17,614	23.6

<sup>1/</sup> Places in which 100 or more meals at one time, or 250 or more meals a day, are served.

Nutrition in Japan; Ministry of Health and Welfare, Japan, 1959.

Exact data for computation of the potential use of nonfat dry milk through the outlet of mass feeding are not available, but estimates based on occupancy and the number of days per year on which meals were served suggest that the use of 27 grams of nonfat dry milk per meal (except in schools where 22 grams was taken as the corresponding quantity) would account for 146 million pounds of nonfat dry milk.

Dairy Industry.--Although the utilization of nonfat dry milk in the manufacture of ice cream varies, depending on the availability of other milk solids, this product offers some possibilities for expanded use of nonfat dry milk solids. Opportunities for increased use in making cottage cheese, buttermilk, and certain other dairy products are rather broad and somewhat indefinite. However as the consumption of these increases, greater use of nonfat dry milk in this area may reasonably be expected. In the United States, where it must be kept in mind the population is nearly double that of Japan and where consumption of dairy products per capita is much higher, the utilization of nonfat dry milk in

the dairy industry increased from 183 million pounds in 1955 to 208 million pounds in 1958.

Other Uses.--The use of nonfat dry milk in the manufacture of confections and by such institutions as hotels and restaurants in Japan has not been recorded as such. However, its use through these outlets, and also in the manufacture of feed in the United States, suggests substantial possibilities over the longer term, 10 to 20 years, in Japan.

Concerning confections, nonfat dry milk has the same advantage over other sources of milk solids as it has for use in bakery products. Demand for confections increases when consumer incomes increase. Accordingly as the level of incomes rises during the period of economic development into which Japan has entered, an expanded market in this field may be expected to follow.

Restaurants, hotels, and similar organizations also offer opportunities for expanded use of nonfat in soups and miscellaneous items such as custards and puddings, or where institutions make their own ice cream.

Because the sanitation requirements for nonfat used in feed may be lower than for that used in food, the manufacture and use of nonfat dry milk for feed offers an outlet for a product that may not meet the standards for food. Although some use in the preparation of calf meal in Japan was reported, there was no evidence of wide-scale use at present in this field.

#### Retail Prices Are High

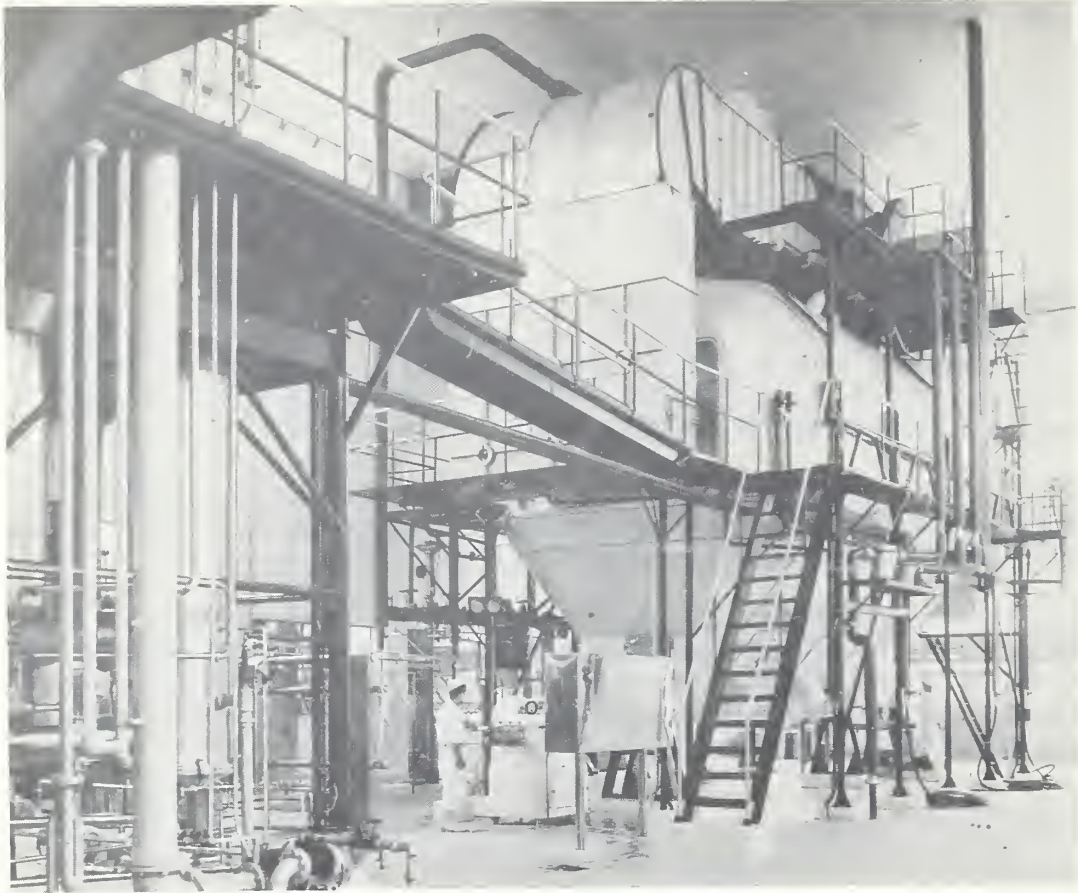
Compared with prices received by producers for milk and income per capita, the retail prices of dairy products in Japan are considered to be high. Butter as of November 1959 was selling for 85.4 cents per pound; cheese, at 87.2 cents; and nonfat dry milk, at 46.4 cents per pound, although a rather wide range in the price of nonfat dry milk was noted, depending in part on whether the product had been subject to the instantizing process. Prices of the standard type of nonfat dry milk in consumer packages of less than 1 pound ranged from 36.6 cents per pound to 41.4 cents per pound. Instant brand nonfat sold chiefly at 50.4 cents per pound in 200-gram (about half a pound) consumer packages and 44.5 to 47 cents per pound in 400-gram cartons.

Dry whole milk was available in consumer packages through some stores at 66.6 cents per pound. However, merchants reported generally that this price was "too high for the Japanese people."

#### Instant Process Increases Sales

The process of making instant nonfat dry milk is comparatively new in Japan. It is designed to improve the dispersibility of spray-process dry milk. Although ordinary spray-process dry milk is over 99 percent soluble in water, a certain amount of agitation is necessary for complete dispersal of the product because of its tendency to lump together--a condition which prevents all particles from making contact with water. Instantizing results in practically complete dispersability, even in cold water. To date, instant nonfat dry milk is marketed mainly in small packages for home use. However, people close to the





Dry milk manufacturing unit with a capacity of 7.5 tons per hour.

Japanese dairy industry feel that as time goes on its uses for industrial purposes will become widespread. Until recently in Japan, special equipment for the process was used to a very limited extent. During the forepart of 1959, one of four leading dairies installed modern instantizing equipment and, by December of that year, it was averaging more than 440,000 pounds in output per month. This is equivalent to an annual output of more than 5 million pounds a year. The dairy company involved reported that during the last 9 months of 1959, its sales of instant nonfat dry milk had more than doubled.

The recent upsurge in the sales of instant nonfat dry milk in Japan suggests very strongly that, at lower retail prices, the market for this product would expand significantly. The current disparity between the price at which U. S. instant nonfat dry milk could be laid down in Tokyo and the price of domestically produced instant nonfat dry milk in Japan in 200-gram containers is roughly 9-1/2 cents per pound. Commercial entry of U. S. nonfat dry milk in Japan is precluded by the lack of allocation of foreign exchange for the importation of nonfat dry milk and by the general reluctance of the Japanese Government to issue import licenses for this purpose. If this barrier to imports were removed, there appears to be little if any question that all types of U. S. nonfat dry milk would soon be appearing in the retail markets of Japan.

### Income Per Capita Low But Improving

One of the principal reasons why the consumption of dairy products, including nonfat dry milk, in Japan is lower than in many other countries is that income per capita has been low.

Although it has more than doubled since 1950, in terms of providing purchasing power for an adequate diet it has presented definite limitations. Because of this, plus the relatively high cost of domestically produced nonfat dry milk and other dairy products, U. S. shipments of nonfat dry milk to Japan have made a basic contribution; they helped to create an appetite for milk among the Japanese and to develop the habit of drinking milk.

TABLE 13.--Population, total national income, and income per capita, Japan, 1950-59

Year	Population	Total national income	Income per capita
	Thousands	Billion yen	U. S. dollars
1950-----	82,900	3,381.5	(1/)
1951-----	84,300	4,347.5	143
1952-----	85,600	4,959.0	163
1953-----	86,700	5,647.0	184
1954-----	88,000	5,984.4	193
1955-----	89,100	6,482.7	202
1956-----	90,100	7,377.9	227
1957-----	90,910	8,282.0	253
1958-----	91,800	8,576.9	260
1959-----	92,800	8,928.0	2/ 267

1/ Estimated to be less than \$130.00.

2/ Preliminary.

### Expenditures for Foods Vary

Analysis of consumer expenses for foods by income groups in Japan shows that here, as in other countries, the proportion of income spent by urban worker families on food decreases as the income increases. Also, the proportion spent on milk and eggs goes up as incomes go up. The significance of this relationship appears to lie in the projection that, should national income increase by 2.5 times in the next 9 years as it did in the last 9 years, the demand for milk and eggs may reasonably be expected to increase substantially also.

### Government of Japan Follows Program

In January 1955, the Japanese Government formulated an overall 5-year Economic Plan which embraced a development program for agriculture. Measures to improve and expand agriculture to solve the problem of population pressure, and

preserve and develop the land all received attention. The plan also contemplated considerable change in the food habits of the people, whereby much less reliance would be placed on rice and a significant shift to wheat flour foods was to be integrated with greater protein and fat intake. The program has been carried out with considerable success in most of the areas in which it was undertaken.

TABLE 14.--Distribution of monthly family income, expenditures for food and for milk and eggs, and related percentages, Japan 1958 <sup>1/</sup>

Family income	Sampling distribution <sup>2/</sup>	Monthly expenditure for food	Percent of income used for food	Percent of food expend- iture used for milk and eggs
U. S. dollars	Percent	U.S. dollars	Percent	Percent
33.33-----	11.3	21.72	65.0	4.9
55.55-----	24.0	26.66	48.0	6.4
77.77-----	23.5	31.49	40.5	6.8
100.00-----	14.9	35.48	35.5	7.4
122.22-----	8.8	38.64	31.6	7.3
144.44-----	5.1	41.38	28.6	7.5
166.66-----	3.2	44.71	26.8	8.0
188.88-----	1.9	44.08	23.3	7.9
211.10-----	1.2	45.11	21.4	7.4
222.21 and over---	2.5	47.16	21.1	8.7

<sup>1/</sup> Approximately 2,600 families in urban areas are surveyed each month. The sampling distribution by income is believed to be representative for urban areas.

<sup>2/</sup> Adds to 96.4 percent. 3.6 percent of families in the sample had monthly incomes less than \$22.22 and are not shown here because of the distorting influence of relief and charity assistance.

Basic data, Statistics and Survey Bureau, Office of the Prime Minister, Tokyo, Japan, December 1959.

At the time of this study, a 20-year economic plan was reported to be under preparation by an economic planning agency. The new plan is expected to take into account the changes that have occurred since 1955 and to set up new long-range projections. Although the plan was not available for review in December 1959, wider diversification in farming, increased efficiency in production, and less dependence on imports of foodstuffs were indicated for probable inclusion in the extensive agricultural development program to be incorporated.

#### Foreign Trade in Dairy Products Currently Small

During 1958, the whole milk equivalent of imports of dairy products into Japan



was roughly 25 million pounds. The United States figured most prominently as a source of nonfat dry milk. The Netherlands, Denmark, and Australia were the principal sources of cheese. Denmark and Australia were also the principal suppliers of Japan's relatively small imports of butter.

The whole milk equivalent of Japan's exports of dairy products during 1958 was less than 12 million pounds, the bulk of which (9.5 million pounds) was accounted for in the form of dried milk and cream.

TABLE 15.--Dairy products: Imports by country of origin, Japan 1958

Country of origin	Butter	Cheese	Evapo- rated milk	Con- densed milk	Dried whole	Dried skim	Other dried
	<u>1,000</u> <u>pounds</u>	<u>1,000</u> <u>pounds</u>	<u>1,000</u> <u>pounds</u>	<u>1,000</u> <u>pounds</u>	<u>1,000</u> <u>pounds</u>	<u>1,000</u> <u>pounds</u>	<u>1,000</u> <u>pounds</u>
United States----	8	43	48	1	23	43,445	60
Denmark-----	351	295	4	---	---	---	2
Netherlands----	2	942	---	---	---	---	---
Australia-----	44	153	---	---	---	1,611	---
New Zealand----	3	50	---	---	---	3,154	---
Others-----	3	119	8	3	---	---	---
Total-----	411	1,602	60	4	23	48,210	62

Ministry of Agriculture and Forestry, Tokyo, Japan, December 1959.

Unmistakably, it is the policy of the Japanese Government to protect and foster domestic agriculture. High rather than low tariffs against dairy products as well as bilateral trade agreements between Japan and various other countries continue to play an important role in the direction of the government trade program and allocations of foreign exchange for imports. Since no agreements relating to specific commodities exist between the United States and Japan, most purchases are undertaken through registered private firms on a commercial basis. An exception to this is the government-to-government purchases through Public Law 480 and purchases under concessional sales.

All commercial imports into Japan require import licenses issued under one of three types of import systems. Those are the automatic approval, the exchange funds allocation system, and the global system. Dairy products are imported commercially under the amount of foreign exchange allocated for their importation, and this has been relatively small. During 1958, U. S. exports of dairy products to Japan, exclusive of government programs, included only 60,000 pounds of cheese, 21,000 pounds of dry whole milk, and 24,000 pounds of evaporated milk. During 1959, strictly commercial exports of U. S. dairy products to Japan included the following, in pounds: Butter, 3,060; cheese, 26,250; and dry whole milk, 7,000.

Current rates of import duties on dairy products in Japan are as follows: 10/ Butter, margarine, and ghee, 35 percent ad valorem; cheese, 35 percent; whole milk (condensed, evaporated, or dried), 30 percent; skim milk (condensed, evaporated, or dried), 25 percent; and infant's foods, 30 percent. Nonfat dry milk entered for school lunch purposes is exempt from import duty, but it is required that complete records be kept concerning such shipments received.

According to the conference rate, the ocean freight on nonfat dry milk between U. S. Gulf ports and Yokohama, Japan, is \$35.50 per long ton (2,240 pounds). This, with the cost of insurance, is equivalent to 1.6 cents per pound.

### Increase in Feed Imports Appears Likely

One of the great changes that has taken place in the diet of the Japanese people has been the remarkable increase in the consumption of livestock products. As indicated earlier, the per capita per day consumption of milk and milk products was 6.8 grams in 1950 and 24.6 grams in 1958; for meat, it was 12.0 grams in 1950 and 20.1 grams in 1958. To satisfy these needs, an estimated 3.7 billion pounds of milk and 353,000 metric tons of livestock meat were produced during 1959.

In order to be ready for the increasing demand for livestock products and to encourage diversification of farming by raising cattle, the Japanese Government expected to increase the number of dairy cattle by approximately 60,000 head during the Japan fiscal year ending March 31, 1960. In addition, the government was planning to substantially increase the numbers of beef cattle and calves and hogs during the same period. Still further, there is a separate long-range program under which the government is seeking to increase the number of dairy cattle to 1 million head by March 31, 1962, when the Japanese population will probably be around 95 million people.

In contrast with the numerical growth of livestock, development of pastures is reported as having fallen behind schedule. The government's goal for developing new intensified grassland in Japan in fiscal year 1959 was 4,600 chobu (1,877 acres), whereas the area actually cleared was approximately 3,500 chobu (1,428 acres). Reasons advanced for this delay are: Insufficient preparatory investigation of the sites proposed; inadequate coordination between government agencies concerned and cattle raisers; lack of government funds for this purpose; and unsettled complications between landowners and surface-right-owners regarding sites proposed. The scope of these factors offers some basis for the opinion that the demand for dairy products may outrun the domestic supply.

One significance of the foregoing lies in the estimate 11/ that the total output of grassland is enough to supply only a small percentage of the overall forage requirements for the present numbers of dairy and beef cattle. The remaining 45 percent is supplemented by indigenous grains and various feed substitutes,

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10/ The Import Tariff of Japan - with Customs Regulations, Customs Office, Yokohama, Japan, December 1959.

11/ Agricultural Report No. 83, American Embassy, Tokyo, Japan, July 13, 1959.



as well as imported feedstuffs. During the year ending June 30, 1959, U. S. exports of feed to Japan were 737,891 metric tons. A 10-percent ad valorem duty on rice was waived through March 1960; and a 20-percent ad valorem duty on wheat was exempted through July 1960, under supplementary provisions of the Customs Tariff Law of Japan.

In view of the relatively few pasture sites remaining and the apparent reluctance of landowners to convert arable land to pastures, the contemplated expansion of livestock production would appear to offer a real potential to the United States for the export of feed to Japan. Although not as direct as some other elements in the U. S. nonfat dry milk export to Japan situation, the impact of these exports as a factor in leading to possibly expanded exports of U. S. feed to Japan in the future is clearly worthy of note.

### Long-Term Export Potential Encouraging

The importance of proper nutrition and the objective of the Japanese Government are expressed in the government's statement that it is not satisfied with just the recovery of the prewar state of health, but that the aim is to become one of the healthy able-bodied and able-minded peoples of the world--well grown in size, too. <sup>12/</sup> The government is aware that the importance of nutrition in achieving that aim must be seriously considered by the whole population. The Ministry of Agriculture has forecast that the nutrition of the Japanese people will most probably continue to improve in the future. <sup>13/</sup> Calorie, calcium, and protein intake will progress gradually, with improvement in both quantity and quality in regard to animal protein, fats, and oils.

It is with this concept in mind that the attitude of the Japanese Government and many Japanese people toward U. S. nonfat dry milk in Japan is favorable and enthusiastic. Government officials, executives in the dairy industry, nutritionists, parents, teachers, and students agree that recipients have benefited greatly from U. S. nonfat dry milk made available to them through school lunch and relief programs.

Readily acknowledged too in Japan is the significant effect that the increasing habit of drinking milk and using bread made from wheat flour will have on achieving the goal of improved nutrition. Children who have participated in the school lunch program are now interested in eating bread instead of rice for breakfast, and are wondering about the possibility of having more milk to drink in the home. Both of these interests are in the long-term process of creating a market for U. S. nonfat dry milk and grain. Bread containing, or to contain, nonfat dry milk increases the associated potential. Deterrents to more rapid progress in this field are lack of knowledge of nutritional values in certain areas, the absence of national and promotional advertising organizations, such as the U. S. National Dairy Council and the American Dairy Association, and the relatively low level of income of the Japanese people generally.

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<sup>12/</sup> "Nutrition in Japan," Nutrition Section, Bureau of Public Health, Ministry of Health and Welfare, Tokyo, Japan, December 1959.

<sup>13/</sup> "Nutrition of Japanese People Improving," Special Report No. 74, American Embassy, Tokyo, May 13, 1959.

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However, from the splendid foundation that already has been laid by various segments of the Japanese Government, dairy associations, nutrition organizations, and individual dairy companies, the Japanese people are rapidly becoming conscious of the food value of milk and dairy products. The prevalence of the retarding factors indicated above leads to the conclusion that during the immediate future the possibilities for U. S. commercial exports of nonfat dry milk and other dairy products are quite limited. However, taking into account the longer span of possibly 10 or 15 or certainly 20 years, at its current rate of progress and development in the areas involved, the potential commercial market may very easily be assessed as being clearly substantial.





